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January 2, 2008

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Licensee Event Report 50-458 / 07-006-00
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

File Nos. G9.5, G9.25.1.3

RBG-46776
RBF1-08-0001

Ladies and Gentlemen:

In accordance with 10CFR50.73, enclosed is the subject Licensee Event Report. This document contains no commitments.

Sincerely,

David N. Lorfing
Manager – Licensing

DNL/dhw
Enclosure

IE22
NRR

cc: U. S. Nuclear Regulatory Commission
Region IV
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Arlington, TX 76011

NRC Sr. Resident Inspector
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NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2010

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
River Bend Station – Unit 1	05000-458	1 of 4

4. TITLE
Unplanned Reactor Scram Due to Transformer Fault

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
11	07	2007	2007	- 006 -	00	01	02	2008	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE
1

10. POWER LEVEL
75

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☒ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
David N. Lorfing, Manager – Licensing	225-381-4157

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
(see text)									

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On November 7, 2007, at 3:06 a.m. CST, an unplanned manual reactor scram was initiated following the loss of the operating condensate pumps. The plant was operating at 75 percent power at the time. The main condensate pumps tripped when power was lost on the "A" non-safety 13.8kv bus, in addition to numerous 480v load centers supplied by that bus. The loss of that 13.8kv bus occurred when a rodent inside a transformer enclosure supplied by that bus caused arcing across phases and to ground. The slow action of the circuit breaker feeding the faulted transformer caused the main feeder breaker to the "A" 13.8kv bus to trip. Following the scram, reactor water level decreased below the actuation setpoint of the high pressure core spray (HPCS) system and the reactor core isolation cooling (RCIC) system, both of which started automatically as designed. Due to the loss of electrical power, the normal service water system was being supplied by only one 50 percent capacity pump, resulting in an abnormally low header pressure. The standby service water system was being placed into service to raise header pressure when the "C" standby service water pump started automatically due to the low pressure condition (this response was as designed, considering the configuration of the system at the time). The Level 2 signal also caused actuation of the primary containment isolation valves in numerous systems, which were confirmed to have responded as designed. This event is being reported in accordance with 10CFR50.73(a)(2)(iv)(A) as an unplanned manual actuation of the reactor protection system, as well as the automatic actuations of the HPCS, RCIC, standby service water, and primary containment isolation systems.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
River Bend Station – Unit 1	05000-458	2007	- 006 -	00	2 OF 4

REPORTED CONDITION

On November 7, 2007, at 3:06 a.m. CST, an unplanned manual reactor scram was initiated following the loss of the operating condensate (SD) pumps. The plant was operating at 75 percent power at the time. The main condensate pumps tripped when power was lost on the "A" non-safety 13.8kv bus (EA), in addition to numerous 480v load centers supplied by that bus. Following the scram, reactor water level decreased below the actuation setpoint of the high pressure core spray (HPCS) (BG) system and the reactor core isolation cooling (RCIC) (BN) system, both of which started automatically as designed. Due to the loss of electrical power, the normal service water system (KG) was being supplied by only one 50 percent capacity pump, resulting in an abnormally low header pressure. The standby service water system (BS) was being placed into service to raise header pressure when the "C" standby service water pump started automatically due to the low pressure condition (this response was as designed, considering the configuration of the system at the time). The Level 2 signal also caused actuation of the primary containment isolation valves in numerous systems, which were confirmed to have responded as designed. This event is being reported in accordance with 10CFR50.73(a)(2)(iv)(A) as an unplanned manual actuation of the reactor protection system, as well as the automatic actuations of the HPCS, RCIC, standby service water, and primary containment isolation (JE) systems.

The actuation of the HPCS system is reportable in accordance with River Bend Technical Specification 5.6.9.2, "ECCS System Actuations." In the operating history of the plant, this event was the 14th injection cycle for the HPCS system. An engineering evaluation determined that the nozzle usage factor remained well below the TS administrative limit of 0.70.

BACKGROUND

The 13.8kv electrical system comprises "A", "B", and "C" busses, which can be supplied from offsite power or from the main generator. In addition to powering the reactor feedwater pumps and condensate pumps, the "A" and "B" 13.8kv busses supply power to numerous 4160kv and 480v load centers throughout the plant via step-down transformers. The 13.8kv circuit breakers are General Electric Magneblast units. A manually-operated load break switch is installed on the high side (13.8kv supply) of each 480v (EC) step-down transformer for use during maintenance. Each 480v transformer and switch is enclosed in a housing connected to the associated switchgear.

INVESTIGATION AND IMMEDIATE ACTIONS

The investigation of this event found that a fault occurred on the bus connections of the step-down transformer supplying a 480v load center in the auxiliary boiler building. This fault appears to have occurred when a rodent crawled between bus bars on the high side (13.8kv input) of the transformer, resulting in arcing to ground and then between phases. Significant damage was caused to the load break switch and other subcomponents in the enclosure.

When the fault occurred, the 13.8kv breaker supplying the step-down transformer should have tripped to isolate the fault. That breaker was slow to operate, allowing fault current of sufficient magnitude and duration to trip the main feeder breaker supplying the "A" 13.8kv bus. Although it

could not be conclusively determined, the slow operation of the 13.8kv breaker to the transformer was likely due to hardened, dirty grease in the breaker mechanism.

When the "A" 13.8kv bus feeder breaker tripped, both the running condensate pumps tripped, resulting in a low suction header pressure to the reactor feedwater (SJ) pumps. (The running feedwater pumps were powered by the "B" 13.8kv bus, and were not directly affected by the fault.) This protective feature caused an automatic trip of the feedwater pumps after a designed time delay. When the reactor operator recognized the condition, he manually initiated a reactor scram before the low water level scram signal could automatically actuate.

Reactor water level decreased to the Level 2 setpoint where the HPCS and RCIC systems automatically actuated. As reactor water level then started to increase, operators took manual control of those systems in accordance with procedural guidance, and stabilized water level. The operators manually closed the inboard main steam isolation valves to control the reactor cooldown rate. Due to the loss of electrical power, it was not possible to maintain vacuum in the main condenser, which necessitated the closure of the outboard MSIVs. The operators then manually cycled reactor safety-relief valves (SRVs) to maintain reactor pressure within a prescribed band.

Power was restored to the "A" 13.8kv bus at 12:45 p.m. that day. The residual heat removal "A" loop was placed in the shutdown cooling mode of operation at 4:26 p.m. Mode 4 (cold shutdown) was entered at 7:42 p.m.

The damaged transformer was isolated to preserve evidence for the investigation. The power supply leads to that transformer were disconnected from the 13.8kv bus.

CORRECTIVE ACTIONS TO PREVENT RECURRENCE

A detailed examination of the damaged equipment was performed to determine the source of the fault. Company and vendor specialists assisted the site staff in retrieving and analyzing recorded data. This information was used to reconstruct the detailed sequence of events and to investigate the response of the affected circuit breakers.

Numerous corrective actions are being taken in response to this event.

- Rodent traps have been placed in vulnerable areas.
- A contract for a rodent abatement program for buildings inside the protected area will be instituted.
- Preventative maintenance (PM) procedures for switchgear and transformer enclosures will be revised to provide guidance on inspecting the equipment for signs of rodent intrusion.
- The existing plan for scheduled overhauls of Magneblast circuit breakers will be accelerated for completion in the upcoming refueling outage beginning in January 2008 (except for one breaker which is not in service).
- PM frequencies will be increased for switchgear located in buildings outside the power block to ensure that breaker grease remains fresh.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
River Bend Station – Unit 1	05000-458	2007	- 006	- 00	4 OF 4

PREVIOUS OCCURRENCE EVALUATION

No reactor scram with a similar initiating condition has occurred at River Bend Station in the last ten years.

SAFETY SIGNIFICANCE

At the time of this event, there were no safety-related systems out of service. The reactor operator responded to the event by manually actuating a reactor scram before reactor water level reached the automatic trip setpoint. Operators promptly established control of reactor pressure and water level, and proceeded with a plant cooldown until the shutdown cooling system was put into service. No reactor SRVs were required to operate in the safety mode. All affected safety-related systems operated as designed. This event was of minimal safety significance to the health and safety of the public.